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ABSTRACT

The results of a project undertaken to develop a usable file of measures appropriate for use with children from birth through age 8 and to formulate a reliable system for cross-classifying instruments by construct and response methodology are presented. The completed file referenced 800 readily available measures from published and unpublished sources. The completed project included three methods of data retrieval: a series of indices, multiple inquiry keysort cards, and a computerized routine which prepared construct-response methodology profiles for each instrument. Uses of the file for developing uniform terminology and for examining instrument commonalities are discussed. (Author)

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A CRITICAL SURVEY OF TESTS AND MEASUREMENTS
IN EARLY CHILDHOOD EDUCATION

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Presented at the AERA Annual Meeting
Chicago, Illinois, April, 1974

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A Critical Survey of Tests and Measurements
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This paper presents a summary of a two year project undertaken to develop a usable file of tests and measures appropriate for use with children from birth through the age of eight, and to formulate a reliable system for item classification based upon the construct assessed and upon the mode of response required.

The instrument collection phase of this project might not have been attempted a few years ago. However, now with the resurgence of interest in the problems of the young, a variety of new measurement devices has also emerged. In fact, the instruments now available from published, unpublished, and fugitive sources are so plentiful that the task of the evaluation has begun to shift from instrument construction to instrument retrieval. This project attempts to reflect this transition by producing an index which will introduce specialists in early childhood to the diversity of evaluation materials already available and to speed the search for appropriate instrumentation.

Presented at the AERA Annual Meeting, Chicago, Illinois, April, 1974

Construction of the Test File

Existing Sources of Information

Without doubt, the most comprehensive source of information on published measurement devices is the whole set of *Mental Measurement Yearbooks* by O. K. Buros. As a source for published measures the *Yearbooks* are standards. Nicely augmenting Buros is *Tests and Measurement in Child Development: A Handbook* by Johnson and Bommarito (1971). Here the focus is exclusively upon measures which have appeared in a journal, research report or other publication, but which have not been published commercially. All instruments included are considered suitable for use with children from birth to age 12. Critical acceptance of the *Handbook* has already begun to make this book a valuable companion piece to the Buros volumes of published materials. With the authors' commitment to five year updates, future usability also seems assured.

Designed as do-it-yourself guides to the location and selection of appropriate and usable published tests are the Center for the Study of Evaluation Publications, *Elementary School Test Evaluations* (1970) and *CSE-ECRC Preschool/Kindergarten Test Evaluations* (1971). The intent of these products is clearly evaluative. Tests and subtests are given letter grades in categories of measurement validity, examinee appropriateness, administrative usability, and normed technical excellence "in order to identify and endorse those measures most appropriate, effective, and useful in assessing schools or students" (*CSE-ECRC Preschool/Kindergarten Test Evaluations*, 1971, p. xvi).

Perhaps the most formidable single listing so far compiled is the one done by Annie Butler (1971). It includes over 600 preschool evaluation instruments gathered from sources which ranged from publisher's catalogs to personal communications.

Finally, aiming primarily at comprehensiveness, rather than either evaluation or systematic classification, is the Head Start Collection of the Educational Testing Service. This collection was designed to supplement the activities of the ERIC Clearinghouse for Tests, Measurement, and Evaluation by collecting and abstracting published and unpublished measures appropriate for use with children from birth to nine. Spinning off from this core collection have been periodic reports, listings, bibliographies, and bulletins which have provided information on an amazing array of instrumentation in all phases of development.

Supplementing the broad-band of sources cited so far are a variety of sources which are organized around some particular area of interest. Table I presents a sample of those specialized listings which contain sizable numbers of tests and measures which are useful in early childhood.

Insert Table I about here

Scope of this Inquiry

With all the information that seems available already, it seems reasonable to wonder why another listing of tests and measurements is needed at all. Perhaps the best reason is that a single source which pulls together and expands upon the sources previously cited would

Table 1

SPECIALIZED LISTINGS OF TESTS AND MEASURES
IN EARLY CHILDHOOD

Specialized Area	Source Information
Mentally Retarded-- Intellectual Development	R. M. Allen and S. P. Allen, <i>Intellectual Evaluation of the Mentally Retarded Child: A Handbook</i> . Los Angeles: Western Psychological Services, 1972.
Self Concept	B. Kramer, <i>Self Concept Development: An Abstract Bibliography</i>. Urbana, Illinois: University of Illinois--Champaign-Urbana, 1972. A. R. Collier, <i>The Assessment of "Self-Concept" in Early Childhood Education</i>. Urbana, Illinois: University of Illinois--Champaign-Urbana, 1971. J. Knapp, <i>A Selection of Self-Concept Measures</i>. Princeton, New Jersey: Center for Statewide Educational Assessment, Educational Testing Service, 1973. R. C. Wylie, <i>The Self Concept</i>. Lincoln, Nebraska: University of Nebraska Press, 1961.
Personality/Affect	W. H. Beatty (Ed.), <i>Improving Educational Assessment and an Inventory of Measures of Affective Behavior</i>. Washington: Association for Supervision and Curriculum Development, National Education Association, 1969. O. K. Buros (Ed.), <i>Personality Tests and Reviews</i>. Highland Park, New Jersey: Gryphon Press, 1970. R. B. Cattell and F. W. Warburton, <i>Objective Personality and Motivation Tests</i>. Urbana, Illinois: University of Illinois Press, 1967.

Table 1 (continued)

Specialized Area	Source Information
Reading	O. K. Buros (Ed.), <i>Reading Tests and Reviews</i>. Highland Park, New Jersey: Gryphon Press, 1965. R. Farr and N. Anastasiow, <i>Tests and Reading Readiness and Achievement</i>. Newark, Delaware; International Reading Association, 1969. M. Griffin, L. Hibbard, and K. Muldoon, <i>Guide to Clinical Evaluation Instruments in Reading</i>. ERIC/CRIER Reading Review Series. ERIC Document 066 714, January 1973.
Mathematics	S. S. Myers and F. G. Delon, <i>Mathematics Tests Available in the United States</i>. Washington: National Council of Teachers of Mathematics, Inc., 1968.
Fine Arts	T. J. Johnson and R. J. Hess, <i>Tests in the Arts</i>. St. Louis, Missouri: CENREL, Inc., 1970.
Physical Education	M. G. Scott and E. French, <i>Measurement and Evaluation in Physical Education</i>. Dubuque, Iowa: William C. Brown, 1959. C. H. McCloy and N. D. Young, <i>Tests and Measurements in Health and Physical Education</i> (3rd Ed.). New York: Appleton-Century-Crofts, 1970.
Family Roles and Behavior	M. A. Straus, <i>Family Measurement Techniques: Abstracts of Published Instruments, 1936-1965</i>. Minneapolis, Minnesota: University of Minnesota Press, 1969.
Classroom Observation	A. R. Collier, <i>Systems for the Observation of Classroom Behavior in Early Childhood Education</i>. ERIC Document ED 068 204, April, 1972.

Table 1 (continued)

Specialized Area	Source Information
Classroom Observation (continued)	A. Simon and E. G. Boyer, <i>Mirrors of Behavior: An Anthology of Classroom Observation Instruments</i> . Philadelphia: Research for Better Schools, 1970.
Handicapped	J. E. Morris and C. Y. Nolan, <i>Bibliography on tests of the Blind</i> . Louisville, Kentucky: American Printing House for the Blind, 1971.
Social Functioning	C. M. Bonjean, R. J. Hill, and S. D. McLemore, <i>Sociological Measurement, An Inventory of Scales and Indices</i>. San Francisco: Chandler Publishing Co., 1969. Klein Walker, D., <i>Socioemotional Measures for Preschool and Kindergarten Children</i>. San Francisco: Jossey-Bass, 1973. D. G. Lake, M. B. Miles, and R. B. Earles, Jr., <i>Measuring Human Behavior</i>. New York: Teacher College Press, 1973.

still be of interest--especially if the information were presented in a format a user could conveniently digest.

While words like "comprehensive" and "exhaustive" have a nice ring of thoroughness about them, neither claim will be made for this Index. It is in some senses a listing of listings. Therefore, at best, it is only as comprehensive as the materials on which it is based. Specifically, the major source materials systematically reviewed to compile this listing included publishers' catalogs through 1972, *The Sixth Mental Measurements Yearbook* (Buros, 1965), *The Seventh Mental Measurements Yearbook* (Buros, 1972), *Tests and Measurements in Child Development: A Handbook* (Johnson and Bonnarito, 1971), *Literature Search and Development of an Evaluation System in Early Childhood Education* (Butler, 1971), *CSE-ECRC Preschool/Kindergarten Test Evaluations* (1971), *CSE Elementary School Test Evaluation* (1970), and *An Annotated Bibliography of Measurements for Young Children* (Bergan, 1969). In addition, a large number of instruments unlisted elsewhere were discovered during the 1972 visit to the Test Collection library of the Educational Testing Service in Princeton, New Jersey. Also, along with a search of many of the specialized listings given in Table 1, ERIC documents provided the final source used in developing this Index.

Perhaps future efforts aimed at developing an exhaustive listing of assessment devices used in early childhood will find this listing academically muddled. There are undoubtedly loose ends since page by page searches of particular journals within specified time periods were not undertaken. Still, while perhaps suffering from a lack of scholarly neatness, this Index is the largest single source available to date

encompassing 800 instruments from published and unpublished sources.

Instrument Selection Criteria

Age range. For an Instrument to be Included here it must be suitable for use with children between birth and the age of eight (inclusive). While many of the Instruments listed here may be used beyond age eight, they are included because some portion of their applicable age range extends downward to include children between birth and eight. In cases in which a publisher or author reported grade levels rather than age ranges, grade three was considered the upper limit for inclusion.

Availability. Overriding all other considerations has been an insistence on listing only those Instruments which are readily available to the prospective user. To be Included in this collection, an Instrument met at least one of the following requirements: (a) listed for sale in the most recent edition of a publisher's catalog; (b) Included in its entirety in a book or professional journal; (c) Included in its entirety in an ERIC document; (d) deposited with ASIS/NAPS of the Microfiche Systems Corporation; or (e) available upon request from a test author or institutional source. In addition, on grounds that the user would like to expend as little effort as possible in Instrument search and acquisition, Instruments used in unpublished theses or dissertations, those published in foreign languages, or available solely through European publishers were excluded. The only exception to these guidelines was that a small number of instruments available only through European houses were included if they were referenced in U. S. Journals. To be certain that all listings which had individual

or institutional sources were available, letters were sent to each author and institution requesting either a copy of the instrument or specific information on how to obtain one. If at least two requests for information went unanswered or if no known address was available, the instrument was excluded. Also requests made by researchers that their instrument be excluded from listing were, of course, honored. As an aside, had all the sources examined yielded available instruments the index would have had well over 1,000 entries.

But not usability. Unlike many of the other listings reviewed, no specific criteria defining usability were established. Instruments were not excluded because of lack of or inadequate scoring systems, difficulty of administration, lack of appropriate normative data, or spotty technical reporting. It was felt that judgments of these kinds were better left to the user. In compiling this index, the assumption throughout has been that if an instrument is first of all available, there must be someone, somewhere, who will consider it usable.

Source Documents

Information on the instruments included in the index came from a variety of sources. In the case of research instruments published in books or journals, the reference was considered the source document. Information on unpublished instruments was obtained from whatever material was furnished by the individual test developers. This material varied in completeness from a single mimeographed sheet of items to complete packages, including the test itself, administration procedures, and technical data. Finally, in the case of commercially published materials, specimen copies and manuals of inexpensive tests were purchased, while

more expensive instruments and materials were examined at the Test Collection Center of the Educational Testing Service in Princeton, New Jersey.

Content

The following information is available for each of the instruments in the index.

1. **ACCESSION NUMBER.** Each of the instruments has been assigned an arbitrary accession number ranging from 0001 to 0800.
2. **TITLE.** The title given to the instrument by the author, publisher, or a previous abstractor. Since most of the instruments listed here did appear in some other source, assigning names was rarely necessary. If the test had an acronym, it was also included.
3. **AUTHOR.** The listed author, authors, or institutional source.
4. **SOURCE.** The person, institution, publisher, reference, or service to contact along with current addresses wherever needed.
5. **SHORT DESCRIPTORS.** One or more terms used to describe the general topic of interest. For the most part these terms parallel those used in the "major classifications" of Buros.
6. **SPECIFICS.** Included here is specific information on the cost of the specimen and multiple copies of the test; cost of technical and administration manuals as of 1972; date of the most recent publication, copyright or reprint, approximate time needed for administration; number of forms available; appropriate age range; and form of administration. Again,

since the material accompanying test instruments varies so much in what is presented, a complete set of specifics may not be available for every measure.

7. RESUME. A brief summary of test properties including normative information, reliability, and validity procedures. The particular content and format of the resume varies according to the kind and quality of information available for review. It should be stressed that the resume is not in any sense intended to be an "evaluation" of the instrument. Judgments of those kinds are left to user.

A Guide to the Indices

The contents of the test file is displayed using five different indices. Each of the indices provide a different point of entry to permit information retrieval by users with diverse requirements. Of these five indices, the Accession Index is the most comprehensive. Arranged in numerical order, it displays all of the available information for each instrument in the file. Figure 1 illustrates a sample listing from the Accession Index.

Insert Figure 1 about here

The other displays include a Title Index, an Author Index, an Age Range Index listing accession numbers by appropriate age ranges, and an Index of Descriptors which collects all of the accession numbers used under each descriptor.

Figure 1. Sample Listing from Accession Index

Category ①	TITLE _____	0059	Screening Test for Academic Readiness (STAR)
Category ②	AUTHOR _____		A. E. Ahr
Category ③	SOURCE _____		Priority Innovations
Category ④	SPECIFICS _____		C-SPEC=2.50, TEST=20.00/35*D=1966* T=60*F=1*AG=456*AD=G
Category ⑤	DESCRIPTORS _____		***INTELLIGENCE-GROUP
Category ⑥	RESUME _____		NORMS INCLUDE DEVIATION IQ.'S BASED ON TOTAL SCORE, AND RAW SCORE NORMS FOR CHRONOLOGICAL AGES AND SUBTESTS*SELECTION OF NORMATIVE SAMPLE UNSPECIFIED*RELIABILITIES RANGE FROM .87 TO .93 USING FOUR METHODS OF RELIABILITY ESTIMATION*CORRELATION WITH STANFORD-BINET (L-M) RANGES FROM .67 TO .72*CORRELATION WITH METROPOLITAN READINESS WAS .76**

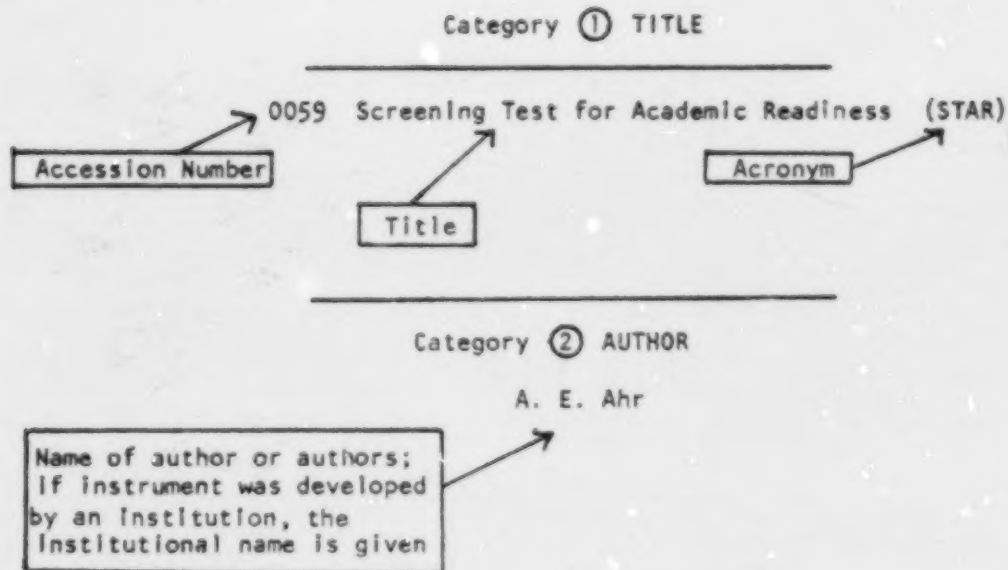


Figure 1. (continued)

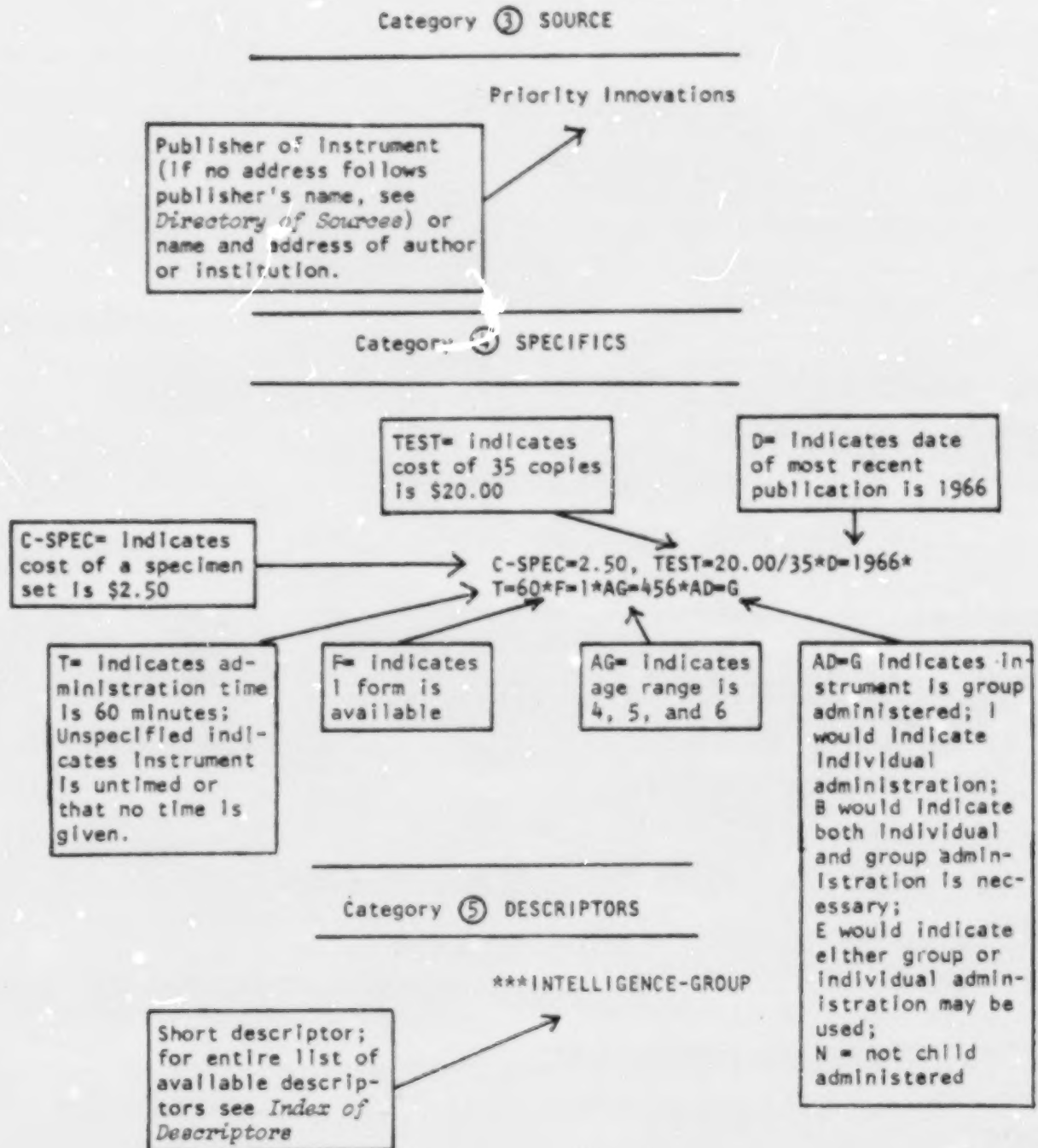


Figure 1. (continued)

Category ⑥ RESUME

Resume provides abstract
of descriptive and/or
available technical
information



NORMS INCLUDE DEVIATION IQ.'S BASED ON
TOTAL SCORE, AND RAW SCORE NORMS FOR
CHRONOLOGICAL AGES AND SUBTESTS*SELECTION
OF NORMATIVE SAMPLE UNSPECIFIED*RELIABILITIES
RANGE FROM .87 TO .93 USING FOUR METHODS
OF RELIABILITY ESTIMATION*CORRELATION WITH
STANFORD-BINET (L-M) RANGES FROM .67 TO
.72* CORRELATION WITH METROPOLITAN READINESS
WAS .76**

Item Classification Procedures

While the word "survey" in the title of this paper refers to the development of an extensive test file as described in the previous section, "critical" refers to a set of more fine-grained procedures developed to look at each instrument at the item level. The intent of these procedures is to provide the user with information about the kinds of constructs individual items measure and how each of those constructs are assessed.

Perhaps this kind of information is several steps removed from the practical problem of instrument selection which may be of interest to the majority of users. However, problems of item mesh with curriculum objectives are of continuing concern to test developers and program evaluators who must carefully tailor measures to assess specific sets of objectives. Additionally, by cross referencing items according to constructs they assess as well as by the techniques, item formats or response methodologies used to make those assessments, it becomes possible to define pools of items which measure similar constructs by diverse methodologies as well as items which assess diverse constructs by similar methodologies. These classification procedures could then be used by program developers to generate alternative sub-scores which may be more useful conceptually and analytically than those originally intended by test developers. This section presents an outline of the two dimensional item classification systems developed here.

Construct Domains

The first property or dimension along which items may be classified is based on item content. That is, in writing an item, the test constructor intended to assess some particular construct. Determining what that construct was and how it fits into the scheme used here forms the basis for classification by construct domain.

The procedure for classification by construct follows a two step assignment procedure. First, a gross classification is made by assigning an item to one of four content domains--affective, cognitive, psychomotor, or subject matter. Then a more refined placement is made by assigning a more specific construct to the item. For example, given an item such as "Count to ten for me," classification by construct domain would be completed when the item had been placed into the "Subject Matter Domain" under the more specific construct category, "Basic Number Skills." Table 2 lists each of the domains and constructs used in item classification.

Insert Table 2 about here

Response Methodologies

The second dimension used in item classification is based on an analysis of the psychometric structure of the item rather than its formal content. Here what is analyzed is the item format and the type of response required of the child. Based on a set of standard definitions, each item is classified into one of 15 response methodologies.

Table 2

LISTING OF CONSTRUCT DOMAINS

A. Affective Domain

01 Social Interaction

Cooperation; participation in group activities; relations with others in home, school, community; understanding of social standards of right and wrong; awareness of role characteristics; awareness of others; poise; relations with authority figures.

02 Emotional Reactions

Anxiety; frustration; reaction to novel situations; hostility; depression; nervous symptoms; aggressiveness; pleasure; joy; happiness; fears; affection

03 Behavioral Style

Initiating-withdrawing; active-passive; organized-disorganized; analytical-global; dominant-submissive

04 Motivation

Sustained involvement or interest in recreational or school related activities; delay of gratification; ability to set goals; competitiveness; curiosity (regarding objects, inspection of body, exploration); general energy level; listening; performing according to ability; persistence; need achievement

05 Personal Responsibility

Care of personal property; personal hygiene; responsibility for assumed tasks; self sufficiency

06 Personal Worth

Awareness of capabilities; confidence; satisfaction with self; feeling of belonging; worthiness; integrity; pride

07 Aesthetic Appreciation

Appreciation of music, art, poetry, literature, beauty; self expression; attitudes toward aesthetic activities

08 General Affective Skills

Undifferentiated affective skills; affective skills not otherwise classified

Table 2 (Continued)

B. Cognitive Domain

01 Memory

Memorization of nonsense syllables, lists, designs, stories or information; following directions; searching for objects

02 Spatial Reasoning

Part-whole relationships (puzzles, block designs, etc.); means-end relationships (mazes, paper folding, etc.); transformations (rotations, alternate perspectives)

03 Systematic Reasoning

Predicting outcomes; drawing conclusions; complex problem solving; picture completion; developing sequential relationships

04 Relational Reasoning

Determination of basis of similarity or difference (incongruities, associations, analogies, syllogisms); conservation

05 Information

Vocabulary; concepts; factual understanding

06 Creativity

Number, diversity, or originality of problem solutions

07 General Cognition Skills

Undifferentiated cognitive skills; cognitive skills not otherwise classified

Table 2 (Continued)

C. Psychomotor Domain

01 Reflexive Skills

Winking; pupil contraction; babinski reflex; Moro reflex; sucking

02 Eye-Hand Coordination

Localization of objects in space (reaching for objects or picking up objects); throwing to target; catching; bouncing; striking; tracing; drawing basic shapes

03 Small Muscle Coordination & Kinesthetics

Holding pencil in writing position; scribbling; using tools (hammer, pliers, screwdriver, scissors, etc.); tying; buttoning; zipping; stringing beads; folding paper; building towers; unwrapping objects

04 Large Muscle Coordination & Total Body Coordination

Balance control; locomotor skills (walking, running, jumping, climbing, skipping, etc.); non-locomotor skills (push-pull, bending, twisting, etc.); rhythmic expression; postural control

05 Sensorimotor Skills: Visual

Visual tracking; visual acuity (intensity of light source distance & relative proportion of objects); figure-ground relationships; color and shape distinctions

06 Sensorimotor Skills: Auditory

Auditory tracking; auditory acuity (pitch, intensity, timbre, duration); environmental sounds

07 Sensorimotor Skills: Tactile, Mass, Pain, and Thermal Sensitivity

Textural distinctions; temperature distinctions; tactile stimulation; weight distinctions; pain threshold

08 Sensorimotor Skills: Olfactory and Gustatory

Smell and taste distinctions

09 General Psychomotor Skills

Undifferentiated psychomotor skills; psychomotor skills not otherwise classified

Table 2 (Continued)

D. Subject Matter

01 Basic Number Skills

Number symbols; ordinal numbers and relationships (first, middle, last, etc.); counting; odd-even numbers; relating objects with numbers; geometric shapes (circle, square, rectangle, etc.); figures; lines (straight, curved, perpendicular, etc.); angles; quantitative concepts (few, many, smaller, etc.); measurement (weight, volume, area, length, perimeter, etc.); concepts related to money; temporal concepts (times of day, months, weekdays, seasons, clock use, etc.)

02 Basic Language Skills

Relating speech sounds to objects, events, or words; communication of needs, information, and experiences using words, phrases, or sentences; story telling; positional terms (on top of, behind, etc.); directional terms (left-right); rhyming; opposites; syntax (tenses, transformations); morphology (plurals, possessives, contractions, etc.)

03 Arithmetic

Fundamental operations with whole numbers; symbols for fundamental operations; terminology and operations with fractions or decimals; place values; sets; word problems; basic numbers; graphics; probability

04 Reading

Letter symbols relating letters with sounds; word; sentence, paragraph comprehension; reading speed; reading fluency

05 English

Punctuation; capitalization; word usage; grammar; spelling; literature; composition; information acquisition skills (dictionary skills, library use, etc.)

06 Music

Vocal music; instrumental music; dance; musical style

07 Art

Painting; drawing, coloring; sculpture; craft activities; artistic concepts and procedures (balance, form, perspective, structure, color mixing, brush use, etc.); alternatives presented by various media; artistic styles

Table 2 (Continued)

D. Subject Matter (cont.)

08 Foreign Languages

Written, aural comprehension, or spoken fluency in a foreign language

09 Health

Physical development (bone, muscle tone, limb, etc.); disease; personal health; nutrition; first aid

10 Safety

Safety principles; accident prevention

11 Science

Life sciences; earth sciences; physical sciences; scientific inquiry

12 Social Studies

Community, national, or world affairs; history; physical geography; cultural geography; government

13 Handwriting

Quality of manuscript or cursive writing

14 Speech

Pronunciation (articulation, accent, inflection and intonation) of speech sounds (single consonants, consonant blends, vowels, words, sentences, etc.) with reference to clarity or acceptability

15 General Subject Matter Skills

Undifferentiated subject matter skills; subject matter areas not otherwise classified

Table 3 defines the set of response methodologies used as well as a prototypical item for each methodology.

Insert Table 3 about here

Projections

Thus far, in the item classification phase of this project, we have developed a manual for classifying test items. Table 4 presents an extract from that handbook.

Insert Table 4 about here

Future work will focus on determining whether our evolving definitions and examples can be used reliably. If they can, our next step will be to classify the 800 tests in the file so that a construct-methodology profile will be available for each of the instruments. These profile will provide an extensive item pool from which criterion referenced measures may be constructed.

Further, by comparing the profiles of a test with intended curricular outcomes, conclusions may be drawn concerning how well assessment meshes with programmatic objectives. For example, in a preliminary examination of 70 instruments, we found that approximately 80 per cent of the items classified used a single method--recognition. Viewed from the angle of many preschool curricula, rich in both instructional techniques and in the variety of skills expected as outcomes,

Table 3

DEFINITIONS OF RESPONSE METHODOLOGIES

01 DETECTION

Given a field into which a sensory stimulus may be introduced, indicate its presence or absence. ("Turn around and don't look at me. Now I'm going to touch you on the back very lightly. Tell me if you can feel me touching you.")

02 MATCHING

Given a specified stimulus and an array of alternative stimuli which includes the specified stimulus, select the specified stimulus from the array. (Show the child this card: Δ | Δ $\square$ $\circ$) Then ask, "Which shape over here (indicate the three shapes to the right of the line) looks just like this one?" (indicate shape to the left of the line)

03 RECOGNITION

Given the name, label, designation or description of a desired stimulus and an array of alternative stimuli which includes the desired stimulus, select the desired stimulus. ("Just by smelling, tell me what you think is in this jar-- peanut butter, chocolate candy, or onions.")

04 IDENTIFICATION

Given a stimulus, supply the name or label corresponding to that stimulus. ("What is this figure Δ called?")

05 DEFINITION

- a) Given a name or label, supply the relevant attributes of the stimulus represented by that label. ("Tell me what a triangle is.")
- b) Given a set of attributes, supply the label or name of the stimulus corresponding to that set. ("What is a three-sided figure called?")

06 SYMBOLIC PRODUCTION/PERFORMANCE

Given the specifications for a verbal stimulus, or a problem or procedure, supply the verbal stimulus or response appropriate to that problem or procedure using written or oral means. ("Tell me a short story that uses these words-- job, shy, sand, people.")

Table 3 (Continued)

- 07 PHYSICAL PRODUCTION/PERFORMANCE
- Given the specifications for a physical stimulus, or a problem or procedure, supply the physical stimulus, or a response appropriate to that problem or procedure using physical, i.e., manipulative means. ("Cut out this picture of an elephant.")
- 08 SYMBOLIC REPRODUCTION
- Given a verbal stimulus, imitate it using written or oral means. ("Listen to this song." (Sing song.) "Now you sing that.")
- 09 PHYSICAL REPRODUCTION
- Given a physical stimulus, imitate it using physical, i.e., manipulative means. ("Watch me fasten this button." (Fasten button.) "Now you fasten the next one.")
- 10 CATEGORIZATION
- Given an array of stimuli which includes exemplars of several sets, select the exemplars of one or more of the specified sets. ("Point to all of the triangles." $\Delta \square \square \Delta \nabla \square$)
- 11 RANKING
- Given an array of stimuli, order them along one or more specified dimensions. ("Here is an airplane, a rabbit, a car, and a turtle. Which one would go fastest? Which one would come next?, etc.")
- 12 MULTIPLE COMPARISONS
- Given an array of stimuli, select the stimulus which has "more" or "less" of a specified attribute. (For each of the six possible pairings of four pieces of sandpaper varying in coarseness, tell the child to, "Point to the one that feels rougher.")
- 13 ASSESSMENT
- Given a specified stimulus and one or more scales consisting of unbroken continua or ordered categories along continua, assign the stimulus to each of the scales. ("Use your pencil as a measuring stick and tell me how many pencils long your desk is.")

Table 3 (Continued)

14 OBSERVATION

Given a standard situation, in which the child responds, describe the response. (Quickly bring your hand toward the child's face. Note whether or not a blink occurs.)

15 AMBIGUOUS RESPONSES

Responses which fit into multiple categories or which do not fit into any of the other fourteen defined categories.

Table 4
EXCERPT FROM CLASSIFICATION MANUAL

03 RECOGNITION

03.A Definition

Given the name, label, designation or description of a desired stimulus and an array of alternative stimuli which includes the desired stimulus, select the desired stimulus.

03.B Prototype

Given the description "triangle," and the figures $\bigcirc + \triangle$, the child can select the figure $\triangle$ from the three choices presented.

Prepare a card like this: $\bigcirc + \triangle$, then ask the child, "Show me the triangle."

03.C Critical Features

03.C.1 The phrase "description of a desired stimulus should be interpreted broadly. It may include a symbol, a label, an enumeration of attributes, a set of directions, a narrative, and so on. The essential feature is that the description structure the item by directing the child's attention to the array of alternative stimuli.

03.C.2 The array of alternatives must include at least two members.

03.C.3 The response description must not duplicate any of the other alternatives.

03.C.4 The alternatives must not represent a continuum or bi-polar dimensions.

03.D Sample Item Classifications

03.D.1 "Just by smelling, tell me what you think is in this jar--peanut butter, chocolate candy, or onions."

Classification: 03 Recognition; appropriate alternatives are provided.

03.D.2 "Match each of the big letters with its own small letter."

T	q
Q	r
R	t

Table 4 (Continued)

Classification: 03 Recognition; since completion of the task involves considering one letter at a time in relation to the array of alternatives, it is primarily a recognition task [primarily--since when only one descriptor and one alternative remain, the task violates critical feature 03.C.2 which requires more than one non-desired response alternative to be available]. The classification is not considered 02 Matching because the response description and the desired response are not considered identical (03.C.3).

- 03.D.3 Name a word that has the same beginning sound as the word "dog."

Classification: 04 Identification; not an 03 Recognition item since critical feature 03.C.3 is violated. If the child were asked the same question and then provided with choices like "dance" and "pal," the item would be classified as 03 Recognition.

- 03.D.4 "Is it true or false that your mother's niece is also your cousin?"

Classification: 13 Assessment; not an 03 Recognition item since critical feature 03.C.4 is violated--the alternatives (true and false) represent assignment to a bi-polar dimension. If the item were rephrased, "Is your mother's niece, your cousin, or your aunt?" it would then be considered as an 03 Recognition item type.

- 03.D.5 "Is your child more likely to read books or play outdoors?"

Classification: 14 Observation; while not specifically stated, 03 Recognition items, like methodologies 01-13, require that a specific response be made *by* the child. Here the response is made by another person *about* the child.

limiting evaluation to only recognition items would seem to by-pass the issue of evaluating instructional objectives.

Conclusion

A major effort to provide quality preschool education programs in recent years has provided the impetus to develop new evaluation, measurement, and assessment instruments. However, many of these instruments which are not published commercially, have had limited visibility. We hope that this project will focus attention on these developing instruments and will stimulate further research on instruments already widely used.

In addition, we would hope that by presenting test profiles based upon item classification, attention will be focused upon the appropriate use of instruments to assess program objectives and the development of new instrumentation which will extend the range of assessment procedures.